

Investigation A



Photo: Path to Point Bonita lighthouse, circa 1940s.

Location: #12 on the map. Near the southeastern end of the suspension bridge, facing nearly west.

The metal tower in front of the lighthouse is the old radio/radar, used before the radar was built near #2 on the map.

Lighthouse keepers used this path day and night, in all kinds of weather, including storms with high winds.

What geologic process is occurring under the suspension bridge?

What are the advantages of building a suspension bridge, instead of the path shown in this photo?

Investigation B



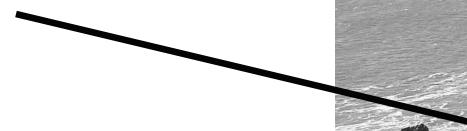
Photo: Pillow basalt arch at Point Bonita

Location: #12 on the map. Near information panel at southeast end of suspension bridge, looking southwest.

Compare the two photos of the pillow basalt arch. What has changed? How can you explain this?

Maximum daily difference between high and low tide for the Bay Area is approximately 3 meters (9 feet).

The yellow line in the picture represents a height of about 16 meters (50 feet).



Investigation C

Photo: Marine terrace, 2004

Location: #14 on the map. Standing near the northeast end of the suspension bridge, facing north. The marine terrace looks like a **sand dune** on top of the cliff.



A marine terrace is an **ancient beach**. Marine terraces are common along the California coast. They often look flatter than the one you see here. Parts of the Coast Highway are built on top of marine terraces.

This terrace is now about 50 meters (150 feet) above sea level.

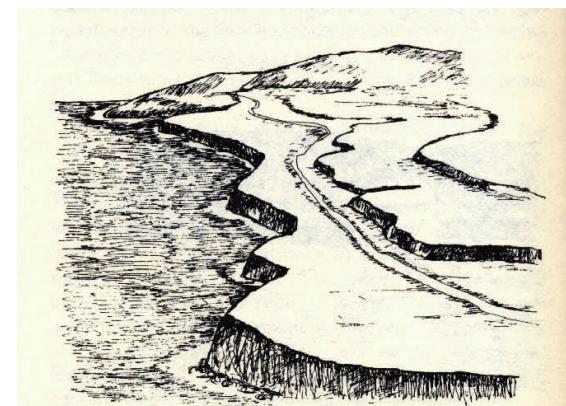


FIG. 52. Terraces along the California coast. In the Palos Verdes Hills, 13 terraces have been cut by the ocean in past years, each marking a former shoreline. The highest terrace is 400 meters (1,300 feet) in elevation, indicating that the Palos Verdes Hills have been lifted that much since this terrace was lapped by the sea.

From California Landscape, by Mary Hill, 1984.

Investigation D



Photo: Fog signal building, 1924.

Location: Between #11 and #12 on the map. Looking southeast from southern end of plastic bridge.

This building was built in 1874 for the stream siren fog signal. When the Lighthouse Service moved the fog signal to the cliff west of the lighthouse in 1903, this building was used for storage.

The San Francisco earthquake in 1906 destroyed a small house at the top of the trail, leaving the families of the lighthouse keepers homeless. For a few years after the earthquake, this building was used as a keeper's home.

Keeper Alexander Martin lived here with his family. He was very nervous about letting his children play outside the house, near the cliffs. Keeper Martin made harnesses for them. Whenever the Martin children played outside, they wore the harnesses and were tied to the house.

Look at the foundation of the old building. What is happening along the eastern side?

Investigation E



Photo: Inclined tram and boat landing. Photo circa 1943.

Location: #11 on the map. Looking north, from cut off pole near the southern end of the old generator building.

The tram and boat landing were first built in 1871, so that the Lighthouse Service could bring supplies to the Point Bonita fog signal.

A horse walked in circles at the top of the tram, pulling the carts of supplies up the hill. In 1902, an engine (called a "donkey engine") replaced the horse.

What kind of rock was the 1871 boat landing built upon? Look at the condition of the landing. Does this tell you anything about the strength of the rock?

Investigation F



Photo by Eadweard Muybridge

Photo: The "Gallery" at Point Bonita, circa 1876.

Location: #7 on the map; Facing southeast, looking at northern tunnel entrance.

The wooden walkway was built to provide access to the steam fog signal (see photo for Investigation D).

From 1855 to 1877, the lighthouse was located where the Coast Guard radar is today (near #2).

Rocksides damaged the wooden walkway in 1872, 1874 and 1876.

The tunnel was dug with hand tools. It was completed in 1877. It is 39 meters (118' long).

The elevated, concrete bridge you see in front of the tunnel entrance was built after a landslide in the 1950s.

Investigation G



Photo: Road bridge along Point Bonita trail, 2004.

Location: #4 on the map, facing south, southeast.

The roadway at #5 on the map was washed away during the El Niño storms in 1982-3.

What geologic process is occurring under the roadway as a result of the El Niño storms? What will this area look like in the future?

Look at the area where the trail turns to the east (between #5 and #6 on the map).

What is happening to the slope below the trail? Look for evidence of earth movement. What will this area look like in the future?

Investigation H



Photo: Lifesaving Service boathouse, circa 1940.

Location: Between #1 and #2 on the map, facing southeast.

The boathouse was first built in 1911. It was destroyed in a landslide in 1912. It was rebuilt and again destroyed by another landslide in 1929. Then it was rebuilt again in 1929. It burned down in the 1950s.

Was this a good location to build a boathouse? Why or why not?

How did the geologic feature here affect the boathouse?

How did the geologic feature here affect the trees you see now?